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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,910	01/30/2004	Hiroshi Yamane	8003-1016-1	5695
<div>465 7590 02/27/2009</div> <div>YOUNG &amp; THOMPSON 209 Madison Street Suite 500 ALEXANDRIA, VA 22314</div>				
EXAMINER				
KERNS, KEVIN P				
ART UNIT		PAPER NUMBER		
1793				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary****Application No.**

10/766,910

**Applicant(s)**

YAMANE ET AL.

**Examiner**

Kevin P. Kerns

**Art Unit**

1793

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 December 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5, 15 and 17-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 15 and 17-21 is/are rejected.
- 7) ☒ Claim(s) 5 and 21-23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☒ Certified copies of the priority documents have been received in Application No. 09/714,161.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-848)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 12/15/08
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 5, 21, and 22 are objected to because of the following informalities: in the last line of claim 5, it is believed that "nozzle" should be added after "immersion". In the 9<sup>th</sup> line of claim 21, replace "opposites" with "opposite". In the 2<sup>nd</sup> line from the end of claim 22, replace "inducing" with "induce". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-5, 15, and 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over unpatentable over JP 6-182518 (complete translation provided by the applicants in the amendment dated October 14, 2005, with the original copy in Japanese and including the drawings provided in the IDS dated April 30, 2004).

As to independent claims 1, 4, and 21, JP 6-182518 (abstract; paragraphs [0002]-[0015], and Description of Drawings of translation; and Figures 1-4, 6-8, and 11) discloses an apparatus for continuous casting of molten metal, in which the apparatus comprises electromagnets each comprising an iron core and coil wound over the iron core, being arranged in a facing relation on opposite sides of the mold along the transverse width (Figures 8 and 11), and energizing means capable to supply AC current to each coil, in the form of a plurality of AC energizing means (abstract; and Figures 4 and 5). The iron core is further comprised of a comb-shaped iron core having comb-teeth (with regard to applicants' claims 2 and 3). JP '518 also discloses a coil with DC current and a coil for AC current (abstract). The apparatus of JP '518 is capable of generating a single phase AC current, such that a single-phase means using one pair of poles, whereas a two-phase means using two pairs of poles, and a three-phase means using three pairs of poles to generate AC current (abstract; and paragraphs [0005]-[0007] of translation). Therefore, since JP '518 discloses using a three-phase AC current, the apparatus is also capable of generating a single phase AC current by not utilizing the other two pairs of poles. Thus, the claims do not define over the disclosure of JP '518. Furthermore, since the core of JP '518 is arranged in the

same manner as that of the applicants' invention, the phase difference would inherently be of either 0 or 180 degrees.

As to the amendment "to induce only vibrating flows" (of independent claims 1, 4, and 21), the examiner respectfully directs the applicants to the structural details of the apparatus of JP '518 set forth in the above paragraph. JP '518 discloses using AC and DC current with electromagnets to produce flows. It is an inherent property that these flows are only vibrating flows that correspond to applicants' Figure 2 (reference number 10). Therefore, JP '518 teaches a nearly identical setup as the applicants' apparatus, while using electromagnets in a combination of AC and DC to induce vibrating flows.

JP '518 fails to teach that the single phase AC current power supply is structurally configured to supply a single phase.

However, it would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the three-phase AC current power supply means of JP '518 to have a single phase means depending on the design expediency. If the continuous casting apparatus does not require a three-phase means, then constructing a single phase means is merely a design choice and would likely reduce costs due to its simpler construction.

As to claim 2 and 3, JP '518 also discloses that both AC and DC current coils are wound on the same iron core (abstract; and Figures 1 and 2).

As to claim 5, the poles are arranged above the ejection port of an immersion nozzle 30 (Figures 8 and 11).

As to claims 15 and 17-20, the AC current of JP '518 is capable of generating a single phase (see above discussion that addresses independent claims 1, 4, and 21) and is continuous (on adjacent coils on the same side of the mold – abstract; and Figures 1 and 2) with the phase difference of either 0 or 180 degrees (also see above discussion of independent claims 1, 4, and 21).

***Allowable Subject Matter***

5. Claims 22 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

6. The examiner acknowledges the applicants' amendment provided with the request for continued examination received by the USPTO on December 15, 2008. In addition, the Information Disclosure Statement (IDS) of December 15, 2008 has been considered and initialed, and a copy is provided with this Office Action. The amendments overcome prior objections to the claims, but new objections to claims 5, 21, and 22 are raised in above section 1. Claims 22 and 23 continue to be indicated as allowable subject matter in above section 5. Claims 1-5, 15, and 17-23 remain under consideration in the application.

7. Applicants' arguments with respect to rejected claims 1-5, 15, and 17-21 have been considered but are moot in view of the new ground(s) of rejection.

With regard to the applicants' remarks/arguments on pages 9 and 10 of the amendment, it is noted that the only argument presented by the applicants is that their new limitation "to induce only vibrating flows" (of independent claims 1, 4, and 21) is allegedly not disclosed and/or suggested by JP 6-182518. However, this feature is addressed by the examiner in the newly underlined portions of above section 3. Contrary to what the applicants appear to be implying on page 9 of the remarks section, claims 22 and 23 were not indicated as allowable subject matter in view of the new limitation added to independent claims 1, 4, and 21. As a result, the applicants are referred to the newly underlined portions of the above 35 USC 103(a) rejections that reflect the new grounds of rejection that were necessitated by the applicants' amendments to independent claims 1, 4, and 21. Claims 1-5, 15, and 17-21 remain rejected.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin P. Kerns whose telephone number is (571)272-1178. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on (571) 272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kevin P. Kerns  
Primary Examiner  
Art Unit 1793

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Primary Examiner, Art Unit 1793  
February 24, 2009